

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/13959

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :C07K 16/46; A61K 39/44

US CL :530/387.1, 403; 424/180.1, 193.1

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 530/387.1, 403; 424/180.1, 193.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BURT, D. S. et al., Analysis of the interaction between rat immunoglobulin E and rat mast cells using anti-peptide antibodies, Molecular Immunology, 1987, Vol. 24, No. 4, pages 379-389.	1-27
Y	BURT, D. S. et al., Inhibition of binding of rat IgE to rat mast cells by synthetic IgE peptides, Eur. J. Immunol., 1987, Vol. 17, pages 437-440, see entire document.	1-27
Y	VERCELLI, D. et al., The B-cell binding site of human immunoglobulin E, LETTERS TO NATURE, 20 April 1989, Vol. 338, pages 649-651, see entire document.	1-27



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Z* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

28 SEPTEMBER 1999

Date of mailing of the international search report

07 OCT 1999

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
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**INTERNATIONAL SEARCH REPORT****International application No.**  
**PCT/US99/13959****C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

<b>Category*</b>	<b>Citation of document, with indication, where appropriate, of the relevant passages</b>	<b>Relevant to claim No.</b>
<b>Y</b>	<b>HELM, B. et al., The mast cell binding site of human immunoglobulin E, Nature, 14 January 1988, vol. 331, pages 180-183, see entire document.</b>	<b>1-27</b>
<b>Y</b>	<b>WO 93/04173 A1 (GENENTECH INC) 04 March 1993, see entire document.</b>	<b>1-27</b>

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## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-27

Remark on Protest

☐  
☐

- The additional search fees were accompanied by the applicant's protest.  
No protest accompanied the payment of additional search fees.

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## BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

I. Group I, claims 1-27, directed to peptides, peptide conjugates, polymeric peptide products and methods of using such products to induce antibodies.

II. Group II, claim 28, directed to nucleic acids encoding the peptide products of Group I.

In view of conversations with the Applicant's attorney it is presumed that the inventive concept hinges on the identity of the IgE-CH3 domain and not on the T helper epitope to which it is attached. The T helper epitopes such as those recited by SEQ ID NOS: 9-12, 61-82 and 84 are therefore considered to have the same or corresponding technical features.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I is directed to peptide products which lack the same or corresponding structural and functional features of Group II which is directed to nucleic acids.